

Appendix 3: Historic San Francisco Bay Tsunami Events

From Tsunamis Affecting the West Coast of the United States, 1806 - 1992, Lander, J.F., Lockridge, P.A., and Kozuch, M.J., 1993 unless otherwise indicated. Dates Universal time – local date is one day earlier in some cases.

Year Month/day	Origin of Tsunami	Validity *	Cause **	Location of Effects	runup (m)	Comments
1851 11/13	N. California San Francisco	1	E	San Francisco Bay	Observed	Unusual water movement felt on ship. Possible seiche.
1852 11/25	N. California San Francisco	1	E	San Francisco	Observed	Lake Merced drained.
1854 10/4	Unknown teletsunami	3	?	San Francisco	<0.1	Waves recorded for 24 hours.
1854 10/22	N. California San Francisco	2-3	E	San Francisco	Observed	Vessels swayed. Water rose 0.6 m with high waves in calm weather near Angel Island.
1854 12/23	Enshunada, Japan	4	E	San Francisco	<0.1	Recorded, earliest known tsunami recording.
1854 12/24	Nankaido, Japan	4	E	San Francisco	<0.1	Recorded
1856 2/15	N. California San Francisco	3	L	San Francisco	0.6	Water rose and stayed high for 5 minutes. Followed 5.9 earthquake.
1856 8/23	SE Hokkaido Island, Japan	4	E	San Francisco	<0.1	Recorded
1861 5/4	N. California	0	A	San Francisco	Observed	Tide dropped 30-45 cm below lowest low tide during the week.
1868 4/3	Hawaii	4	E	San Francisco	0.1	Recorded.
1868 8/13	N. Chile	4	E	San Francisco	0.3	Recorded
1868 10/21	N. California Hayward fault 7.0 earthquake	1 1 3	L	Government Isl Sacramento San Francisco	Observed Observed 4.5	Registered on tide gauge. 0.61 m wave observed. 6.0 M surge on shore at Cliff House.
1869 2/10	N. California San Francisco	1	M	San Francisco	Observed	Earthquake recorded on tide gage?
1869 6/1	N. California	3	E?	San Francisco	Observed	Earthquake waves Recorded
1872 8/23	Fox Islands, Aleutian Is.	3	E	San Francisco	<0.1	First instrumental location for a tsunamigenic earthquake.
1872 9/16	Fox Is. AK(?)	3		San Francisco	0.1	Oscillations recorded.
1877 5/10	N. Chile	4	E	San Francisco Sausalito	0.2 0.2	Recorded. Observed.
1883 8/27	S. Java Sea Krakatau	2	V	Sausalito	0.1	Air pressure wave Recorded.
1887 7/8	N. California	2	L?	Sausalito	Observed	Distinct waves. No source known.
1896 6/15	Sanriku, Japan	4	E	San Francisco	0.2	Sand bag dike

Borrero et al., Numerical Modeling of Tsunami Effects at Marine Oil Terminals in San Francisco Bay
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				Sausalito	0.1	overtopped & festival float destroyed.
1898 ³ 3/31	N. California 6.7 EQ Rogers Cr. fault	3	E	San Francisco Bay	0.6	Earthquake on the Rogers Creek fault. Tossed boats in the bay.
1906 1/31	Columbia-Ecuador	4	E	San Francisco	Observed	Currents observed, boats turned.
1906 4/18	N. California	4	E	San Francisco	0.1	Recorded.
1906 8/17	Central Chile	4	E	San Francisco	<0.1	
1917 5/1	Kermadec Is., South Pacific	4	E	San Francisco	<0.1	Recorded
1917 6/26	Samoa Is.	4	E	San Francisco	<0.1	Recorded
1918 9/7	Kuril Is., Russia	4	E	San Francisco	<0.1	Recorded
1918 11/8	Kuril Is.	2	A	San Francisco	<0.1	Recorded
1918 12/4	Chile	4	E	San Francisco	Observed	Trace on marigram
1919 4/30	Tonga Is.	4	E	San Francisco	Observed	
1922 11/11	N. Central Chile	4	E	San Francisco	0.2	Recorded
1923 2/3	Kamchatka, Russia	4	E	San Francisco	0.1	Recorded
1923 4/13	Kamchatka, Russia	4	E	San Francisco	Observed	
1927 11/4	EQ off Pt. Arguello, CA	4	E	San Francisco	<0.1	Recorded
1928 6/17	S. Mexico	4	E	San Francisco	<0.1	
1929 3/7	Fox Is., Aleutian Is.	4	E	San Francisco	<0.1	Recorded
1932 6/3	Jalisco, Mexico	4	E	San Francisco	trace	Trace on marigram
1933 3/2	Sanriku, Japan	4	E	San Francisco	<0.1	Recorded
1943 4/6	N. Central Chile	4	E	San Francisco	<0.1	Recorded
1944 12/7	Ryukyu Trench, Japan	4	E	San Francisco	<0.1	Recorded
1946 4/1	E. Aleutian Is. Unimak Island	4	E, L	Alameda SF Hunters Pt SF Presidio	0.2 0.1 0.3	Recorded “ “
1946 12/20	Nankaido, Japan	4	E	San Francisco	<0.1	Recorded
1952 3/4	SE Hokkaido, Japan	4	E	San Francisco Sausalito	<0.1 <0.1	Recorded “
1952 11/4	Kamchatka Peninsula, Russia	4	E	Alameda SF Hunters Pt. SF Presidio	0.4 0.2 0.5	Recorded “ “
1957 3/9	Central Aleutian Is.	4	E	Alameda San Francisco	0.2 0.3	Recorded “.
1956 11/6	S. Kuril Is., Russia	4	E	San Francisco	0.2	Recorded
1960 5/22 ⁴	S. Central Chile	4	E	Alameda Benicia	0.58 <0.1	Recorded “

				Berkeley SF Hunters Pt Mare Island Str Oakland SF Presidio San Rafael	Observed 0.1 <0.1 0.37 0.89 Observed	Surges, boats bobbed Recorded “ “ “ Boat torn from mooring
1963 10/13	Kuril Is., Russia	4	E	San Francisco	<0.1	Recorded
1964 3/28 ⁵	Gulf of Alaska - Alaska Peninsula	4	E	Alameda Belvedere Benicia Mare Island Oakland San Francisco San Rafael Sausalito	0.8 0.7 0.12 0.2 1.0 1.1 1.5 1.2	Recorded 0.16 m above MLLW Recorded \$77,500 damage to boats and berths \$100,000 damage at Clipper Yacht Harbor
1965 2/4	W Aleutian Is.	4	E	San Francisco	<0.1	Recorded
1966 10/17	Peru	4	E	San Francisco	<0.1	Recorded
1968 5/16	Honshu, Japan	4	E	Alameda San Francisco	<0.1 <0.1	Recorded “
1975 11/29	Hawaii	4	E	San Francisco	<0.1	Recorded
1987 11/30	Gulf of Alaska	4	E	San Francisco	<0.1	Recorded
1988 3/6	Gulf of Alaska	2	E	San Francisco?	<0.1	Report not confirmed.
1992 4/25	N. California	4	E	Alameda San Francisco	<0.1 <0.1	Recorded “
2001 6/22	Southern Peru	4	E	San Francisco	0.07	Recorded

* Validity: (Soloviev and Go, 1974; and Cox and Morgan, 1977)

0 = Not a valid report

1 = Probably not a valid report

2 = Possibly a valid report

3 = Probably a valid report

4 = Certainly a valid report

** The key to the cause of the event is as follows:

L = Landslide

M = Meteorological

A = Astronomical

E = Earthquake

V = Volcano

Additional source information:

² Topozada, T.R., Branum, D.M., Reichle, M.S., Hallstrom, C.L., 2002, San Andreas fault zone, California: M_≥5.5 earthquake history, Bull. Seism. Soc. Am., 92, No. 7, 2555-2601.

³ Topozada, T.R., Bennett, J.H., Hallstrom, C.L., Youngs, L.G., 1992, 1898 “Mare Island” earthquake at the southern end of the Rodgers Creek fault, in Bortchardt, Glenn and others, editors, Proceedings of the second Conference on Earthquake Hazards in the Eastern San Francisco Bay Area, California Department of Conservation, Division of Mines and Geology Special Publication 113, 385-392.

⁴ Magoon, O.T., 1962, The tsunami of May 1960 as it affected Northern California, ASCE Hydraulics division Conference, Davis, California

⁵ Magoon, O.T., 1966, Structural Damage by Tsunamis, Proceedings, American Society Civil Engineers, Specialty Conference on Coastal Engineering, Santa Barbara (California), Oct. 1965, 35-68.